

WHAT IS CLAIMED IS:

1. An etching method for forming a trench having a prescribed depth in an organic insulating film without using an etching stopper layer, comprising:
 - generating a plasma from a molecular gas containing hydrogen atom and nitrogen atom,
 - measuring a light emission spectral intensity ratio between cyan molecule and hydrogen atom in the plasma, and
 - carrying out an etching process while keeping the measured value at a value not exceeding a pre-scribed value.
2. The etching method of organic insulating film according to Claim 1 comprising:
 - keeping a light emission spectral intensity ratio CN/H at 1 or less, wherein H represents a light emission spectral intensity of hydrogen atom at a wavelength of about 486 nm and CN represents a light emission spectral intensity of cyan molecule at a wavelength of about 388 nm in the plasma.
3. An etching method for forming a trench having a prescribed depth in an organic insulating film without using an etching stopper layer, comprising:
 - generating a plasma from a hydrogen gas and a nitrogen gas or an ammonia gas, and
 - carrying out the etching process while controlling a flow rate of the hydrogen gas so that a light emission spectral intensity ratio between cyan molecule and hydrogen atom in the plasma comes to a value not exceeding a

prescribed value.

4. The etching method of organic insulating film according to Claim 3, wherein said process is carried out while controlling the pressure of processing so as to come to a constant pressure.

5. An etching method for forming a trench having a prescribed depth in an organic insulating film without using an etching stopper layer, comprising:

feeding a molecular gas containing a nitrogen gas and a hydrogen gas or a molecular gas containing hydrogen atom and nitrogen atom into an etching process chamber in which a sample to be etched having an organic insulating film formed thereon has been placed,

adjusting a pressure in the etching process chamber to a pressure lower than 10 Pa,

generating a plasma in which a light emission spectral intensity ratio CN/H is 1 or less, wherein H represents a light emission spectral intensity of hydrogen atom at a wavelength of about 486 nm and CN represents a light emission spectral intensity of cyan molecule at a wavelength of about 388 nm, and

processing the sample to be etched with said plasma.

6. The etching method of an organic insulating film according to Claim 5, wherein a hydrogen gas and a nitrogen gas are used for a formation of said plasma and a mixing ratio of said hydrogen gas to said nitrogen gas is 10 or more.

7. The etching method of an organic insulating film according to

Claim 6, wherein the total flow rate of said hydrogen gas and said nitrogen gas is 200 cc/minute or more.

8. The etching method of an organic insulating film according to Claim 5, wherein said molecular gas containing hydrogen atom is a hydrogen gas, said molecular gas containing nitrogen atom is an ammonia gas, and a mixing ratio of said hydrogen gas to said ammonia gas is 10 or more.

9. The etching method of an organic insulating film according to Claim 8, wherein the total flow rate of said hydrogen gas and said ammonia gas is 200 cc/minute or more.